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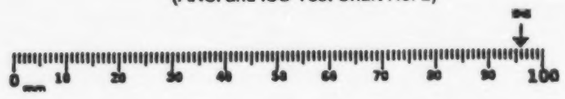

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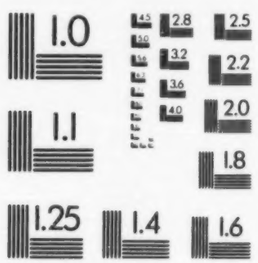

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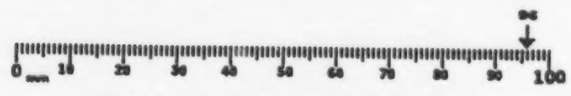

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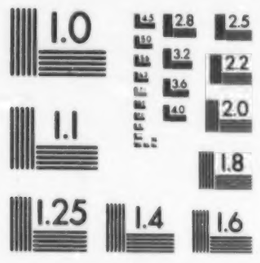

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Brunswick

Natural Resources and Energy
Minerals and Energy

Mineral Resource Report

PRELIMINARY REVIEW OF NEW BRUNSWICK'S MINERAL INDUSTRY *2000*

Edited by
Barbara M.W. Carroll

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Preliminary Review of New Brunswick's Mineral Industry *2000*

This report has been prepared by:

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Hon. Jeannot Volpé
Minister of Natural Resources and Energy

March, 2001

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Brunswick

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SUMMARY

The preliminary value of New Brunswick's mineral production for 2000 is $790 573 087, a decrease of 7% from the final value of $846 536 514 for 1999. This was due mainly to the closure of the Heath Steele mine in October of 1999.

Metals accounted for 66% ($522 973 342) of the total value of production. Of these, zinc, lead, silver, and copper made the largest contribution. Noranda Inc. operated the Brunswick No. 12 mine and Belledune smelter. Operations continue to be suspended at the Caribou and Restigouche mines (Caribou Mine Division of CanZinco Ltd.), Mount Pleasant mine (ADEX Mining Corporation), and the Lake George antimony mine (APOCAN Inc.). During the year, the Murray Brook mine (Murray Brook Resources Inc.) closed and reclamation work was carried out.

Nonmetallic minerals contributed 26% ($202 846 361) to the value of production. The main commodities are potash, peat, salt, and sulphur in smelter gas. The Potash Corporation of Saskatchewan Inc. (New Brunswick Division) operated its mine near Sussex and utilized its Cassidy Lake Division processing facility to upgrade standard-grade potash imported from Saskatchewan. Four limestone quarries were active: Saint John (Brookville Manufacturing), Havelock (Graymont (NB) Limited; Lafarge Canada Inc.) and Sormany (Elmtree Resources Ltd.). Upper Kent Lime Works Ltd. produced marl near Woodstock. Atlantic Silica Inc. and Chaleur Silica Ltd. produced silica from the Cassidy Lake and Bass River areas, respectively. Seventeen companies produced peat valued at $59 621 134 from 33 bogs in New Brunswick.

Coal was valued at $24 172 000. N.B. Coal Limited has continued to reclaim lands disturbed by mining.

Structural materials such as lime, stone, and sand and gravel contributed about 5% ($40 581 384) to the value of production. Nelson Monuments Ltd. (Sussex), Smith Cut Stone & Quarries Limited (Shediac), Maritime Stone Works Inc. (Dieppe), and Bastarache Stone Quarrie (Notre-Dame) produced dimension stone in the province.

The focus of exploration in northern New Brunswick was base metals. Noranda Inc. and Hudson Bay Exploration and Development Co. Limited reported the largest amount of exploration. Diamond drilling was carried out on a number of properties. Trenching and geophysical surveys were also conducted on some properties. Drilling on Lorenzo Noel's Clarinda gold property yielded 5.6 m of 1.79 g/t Au (including 1.5 m of 4.29 g/t Au) in hole CL0003 and 2.0 m of 3.10 g/t Au (including 0.5 m of 5.26 g/t Au) in hole CL0015. The best drill intersection on the Turgeon Cu-Zn property was 19.3 m of massive sulphides grading 2.31% Cu, 0.49% Zn and 0.16 g/t Ag, including a 5 m interval grading 3.79% Cu.

Precious metals and base-metal sulphides were the focus of exploration in southern New Brunswick. Most activity was related to the expansion of resources on known gold properties and the search for new gold occurrences in the southwestern part of the province. Recently, the potential for substantial gold deposits associated with Sn–W-bearing granites has been demonstrated. Gold may also be associated with granite of the Pokiok Batholith. Much interest has been shown in these and other areas in the region that may host additional intrusion-related gold occurrences.

North of Fredericton, Patrick Marr has succeeded in tracing massive sulphide horizons for several kilometres.

J.A. Seglund Inc., RHT Enterprises Ltd., MariCo Oil and Gas Corporation, Corridor Resources Inc./Columbia Natural Resources Inc., and Jean Mariadassou held oil and natural gas licences to search in 2000. Irving Oil Limited, RHT Enterprises Ltd., and J.A. Seglund Inc. held oil and natural gas leases. A.A. (N.B.) Inc. held two bituminous shale development permits. St. Clair Pipelines (1996) Ltd. and Intragaz held one and six underground storage licences, respectively.

SOMMAIRE

La valeur de la production minérale du Nouveau-Brunswick de 2000 se chiffre à 790 573 087$, ce qui représente une diminution de 7% par rapport à la valeur finale de la production de 1999, qui avait atteint 848 536 514$. Cette situation est principalement attribuable à la fermeture de la mine Heath Steele en octobre 1999.

Les métaux, principalement le zinc, le plomb, l'argent et le cuivre, ont représenté 66 % (522 973 342 $) de la valeur totale de la production. La Noranda Inc. a exploité la mine Brunswick n°12 et sa fonderie Belledune. Les activités aux mines Caribou et Restigouche (Mine Caribou, filiale de la CanZinco Ltd.), à la mine du mont Pleasant (ADEX Mining Corporation) et à la mine d'antimoine du lac George (APOCAN Inc.) sont toujours suspendues. La mine Murray Brook (Murray Brook Resources Inc.) a dû fermer ses portes et les travaux de remise en état ont été exécutés au cours de l'année.

Les minéraux non métalliques ont représenté 26 % (202 846 361 $) de la valeur totale de la production. Les principaux produits exploités sont la potasse, la tourbe, le sel et le soufre du gaz de four de fusion. La Potash Corporation of Saskatchewan Inc. (filiale du Nouveau-Brunswick) a exploité sa mine située près de Sussex et utilisé les installations de traitement de sa filiale du lac Cassidy pour raffiner de la potasse de qualité standard importée de la Saskatchewan. Quatre carrières de calcaire ont été actives, soit celles de Saint-Jean (Brookville Manufacturing), de Havelock (Graymont (NB) Limited, Lafarge Canada Inc.) et de Sormany (Elmtree Resources Ltd.). La société Upper Kent Lime Works Ltd. a produit de la marne près de Woodstock. L'Atlantic Silica Inc. et la Chaleur Silica Ltd. ont produit de la silice des secteurs du lac Cassidy et de Bass River, respectivement. Dix-sept entreprises ont produit de la tourbe évalué à 59 621 134 $ à partir de 33 tourbières du Nouveau-Brunswick.

On estime la valeur de la production de charbon à 24 172 000 $. La N.B. Coal Limited a continué à restaurer les terres perturbées par l'extraction minière.

Les matériaux de construction comme la chaux, la pierre, le sable et le gravier, ont représenté environ 5 % (40 581 384 $) de la valeur totale de la production. La Nelson Monuments Ltd. (Sussex), la Smith Cut Stone & Quarries Limited (Shédiac), la Maritime Stone Works Inc. (Dieppe) et la Bastarache Stone Quarrie (Notre-Dame) ont produit de la pierre de taille dans la province.

La prospection dans le Nord de Nouveau-Brunswick a principalement été axée sur les métaux communs. La Noranda Inc. et La Hudson Bay Exploration and Development Co. Limited ont été les sociétés les plus actives à cet égard. Des travaux de forage au diamant ont été exécutés sur un certain nombre de concessions. On a également effectué des fouilles en tranchées et des levés géophysiques sur certaines concessions. Les travaux de forage réalisés sur la concession aurifère Clarinda de M. Lorenzo Noel ont révélé des teneurs de 1,79 g/t d'Au sur 5,6m (dont 4,29 g/t d'Au sur 1,5m) dans le trouCL0003 et de 3,10 g/t d'Au sur 2m (dont 5,26 g/t d'Au sur 0,5m) dans le trouCL0015. Le meilleur recoupement foré sur la concession de Cu-Zn Turgeon a été une section de 19,3m de sulfures massifs titrant 2,31%deCu, 0,49%deZn et 0,16g/t d'Ag, dont un intervalle de 5 m renfermant 3,79%deCu.

Les métaux précieux et les sulfures de métaux communs ont constitué le principal objectif des travaux de prospection réalisés dans le Sud du Nouveau-Brunswick. La majeure partie de l'activité a été reliée à

l'expansion des ressources des concessions aurifères reconnues et à la recherche de nouvelles venues d'or dans le Sud-Ouest de la province. Les chercheurs ont récemment démontré l'existence possible de gîtes aurifères substantiels associés aux granites abritant du Sn–W. Une présence d'or pourrait également être associée au granite du batholite de Pokiok. Les sociétés ont fait preuve de beaucoup d'intérêt à l'égard de ces emplacements et d'autres secteurs de la région qui pourraient abriter des venues aurifères apparentées à des intrusions.

Au nord de Fredericton, M.Patrick Marr a réussi à retracer des horizons de sulfures massifs sur plusieurs kilomètres.

La J.A. Seglund Inc., la RHT Enterprises Ltd., la MariCo Oil and Gas Corporation, la Corridor Resources Inc./Columbia Natural Resources Inc. et M. Jean Mariadassou étaient titulaires de permis de recherche de pétrole et de gaz naturel en 2000. L'Irving Oil Limited, la RHT Enterprises Ltd. et J.A. Seglund Inc. étaient titulaires des baux d'exploitation de pétrole et de gaz naturel. L'A.A. (N.B.) Inc. était titulaire de deux autorisations de mise en valeur de schistes bitumineux. La St. Clair Pipelines (1996) Ltd. et Intragaz étaient, respectivement, titulaires d'un et six permis de stockage souterrain.

EXPLORATION ACTIVITIES

METALLIC MINERALS

Northern New Brunswick

The annual telephone poll, taken in October, indicates that exploration expenditures in the northern half of the Province for 2000 are approximately $8 200 000, up more than a million dollars from last year. For all of New Brunswick, the preliminary figure for 1999 expenditures is $8 500 000 and the forecast expenditure for 2000 is approximately $8 300 000. As ususal, most of the expenditure for base metals was focused on the Bathurst Mining Camp. Since October of 1999, the number of new claims recorded in northern New Brunswick was 1769 and the number of claims in effect was 15 385. Both of these numbers are up relative to last year's figures of 1425 and 14 884, respectively.

The **major companies** that were active in 2000 include Hudson Bay Exploration and Development Co. Limited and Noranda Inc. CanZinco Ltd., Falconbridge Limited, Phelps Dodge Corporation of Canada Limited and Teck Exploration Ltd. held land positions but did not do any work.

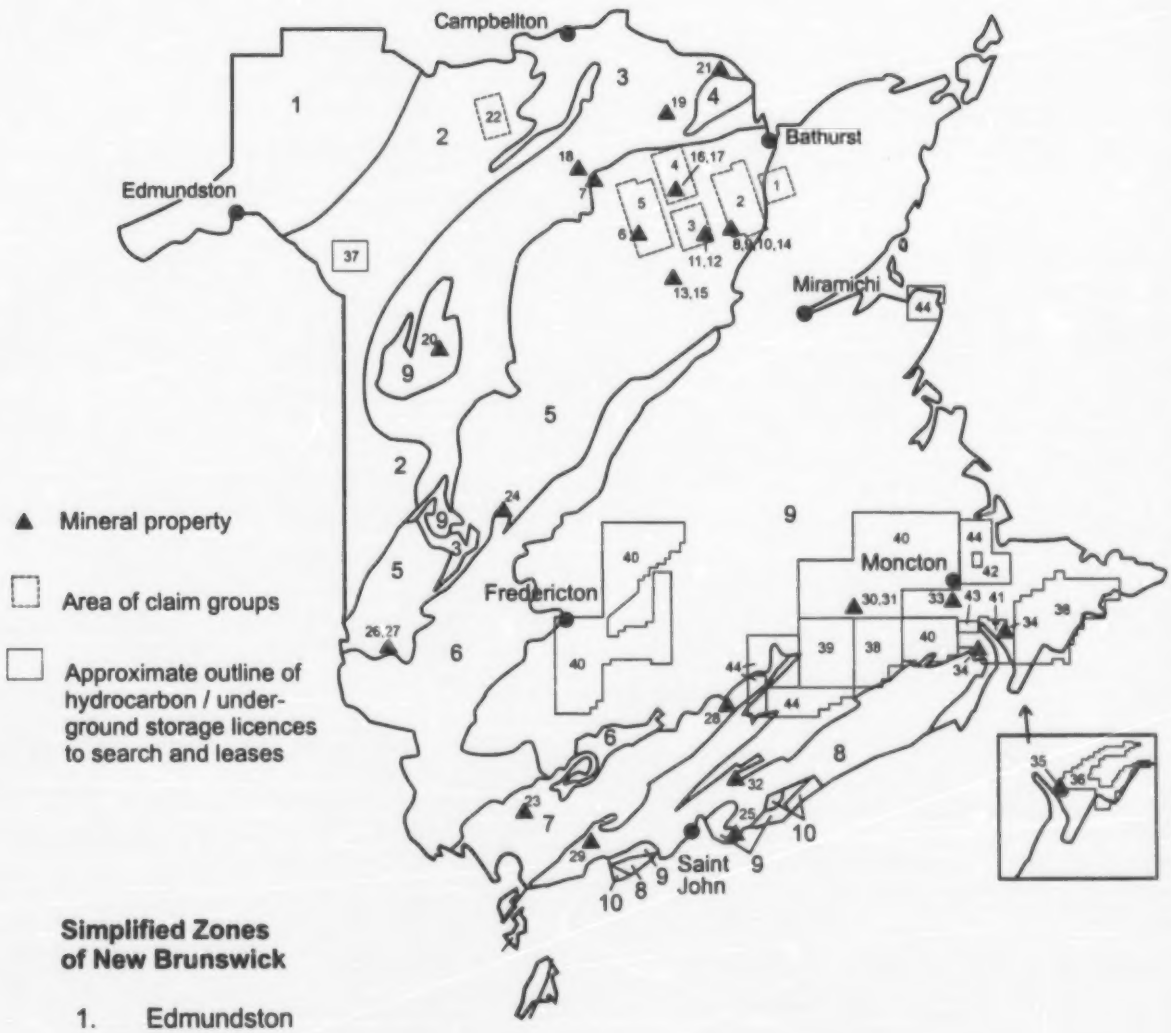
The **junior companies** that were active include Eastmain Resources Inc., Elmtree Resources Ltd., Fancamp Exploration Inc., Heron Mines Limited, Major General Resources Limited, Northeast Exploration Services Limited, Omni Mines Ltd., PGE Resource Corporation and Slam Exploration Ltd., which collectively spent approximately $800 000. All but three of these companies, Elmtree Resources Ltd., Northeast Exploration Services Limited and PGE Resource Corporation, received funding under the New Brunswick Exploration Assistance Program for junior mining firms. Other juniors, such as Black Bull Resources (B.C.) Ltd., Chapleau Resources Limited, Connecticut Development Corporation, Hunter Brook Holdings Ltd. (formerly Key Anacon Mines Limited), Freewest Resources Canada Inc., Kelmet Resources Ltd., Marshall Minerals Corp., Mountain Lake Resources Inc. and Roycefield Resources Ltd., held ground but carried out no work during the year.

Bathurst Mining Camp: Major Companies Noranda Inc. accounts for approximately $7 000 000 of the total exploration expenditure in northern New Brunswick. The company spent all of it within the Bathurst Mining Camp. Approximately, $2 000 000 of this total was spent on a three-dimensional seismic survey in the Brunswick belt. From east to west, Noranda's land holdings are concentrated in five belts: Key Anacon–Lawson Brook belt, Brunswick–Portage River belt, Heath Steele–Mountain Brook belt, Camel Back–Wedge belt and Upsalquitch–Halfmile Lakes belt (Figure 1: 1–5). Notably, Noranda staked 316 new claims this year in the Bathurst Mining Camp; most are in the Brunswick–Portage River belt.

Most of Noranda's work was focused on the Brunswick–Portage River and Upsalquitch–Halfmile Lakes belts (Figure 1: 2, 5). Fifteen holes totalling approximately 14 000 m were drilled on the No. 12 Crown Grant to test the Brunswick horizon along strike from the mine and to depths of about 1 km. However, no significant sulphide zones have been found to date. Another 18 holes totalling approximately 16 600 m were drilled elsewhere in the Brunswick–Portage River belt, mostly on the Gilmour South property, which is about 10 km south of Brunswick No. 6. Some ore-grade intercepts of significant thickness have been encountered in this area over the past two years, but continuity of the good-grade material has not been established to date. One deep hole was drilled early in the year to test a two-

Legend

1. Claims, Key Anacon–Lawson Brook belt (Noranda Inc.; Noranda Mining and Exploration Inc.)
2. Claims, Brunswick–Portage River belt (Noranda Inc.; Noranda Mining and Exploration Inc.)
3. Claims, Heath Steele–Mountain Brook belt (Noranda Inc.; Noranda Mining and Exploration Inc.)
4. Claims, Camel Back–Wedge belt (Noranda Inc.; Noranda Mining and Exploration Inc.)
5. Claims, Upsalquitch–Half Mile Lakes belt (Noranda Inc.; Noranda Mining and Exploration Inc.)
6. Claims, Halfmile Lakes area (Noranda Inc.)
7. Claims, Portage Lakes area (Northeast Exploration Services Limited)
8. Claims, Railroad (Eastmain Resources Inc.)
9. Claims, Captain properties (Eastmain Resources Inc.; Stratabound Minerals Corp.)
10. Claims, Sprig Brook (Eastmain Resources Inc.)
11. Claims, Roche Long Lac (Eastmain Resources Inc.)
12. Claims, Island Lake properties (Eastmain Resources Inc.)
13. Claims, Bills Lake (PGE Resource Corporation)
14. Claims, Nepisiguit Brook Property (Major General Resources Limited)
15. Claims, Clearwater Lake (Slam Exploration Ltd.)
16. Claims, Wedge (Merton Stewart)
17. Claims, Canoe Landing Lake area (Forest Gate Resources Inc.)
18. Claims, Malachite (Log House Construction Ltd.)
19. Claims, Clarinda (Lorenzo Noel)
20. Claims, Lewis Brook (Slam Exploration Ltd.)
21. Claims, Turgeon Deposit (Heron Mines Ltd.)
22. Claims, Simpsons Gulch, Royal Vault, Boland Brook, Indian Brook, Burntland Brook, Ritchie Brook (A. Wayne Lockhart)
23. Claims, Clarence Stream (Freewest Resources Canada Inc.)
24. Claims, Sisson Brook (Champlain Financial Group Ltd.)
25. Claims, Armstrong Brook (Pro-Max Resources Inc.)
26. Claims, Springfield (Patrick Marr)
27. Claims, Deadwater Brook (Sheila Watters); Dead Creek (Mark Connell)
28. Claims, Albright Brook (PGE Resource Corporation)
29. Claims, New River (PGE Resource Corporation)
30. Claims, Hicksville (Graymont (NB) Inc.)
31. Claims, Springhill (Lafarge Canada Inc.)
32. Claims, Bonney Road (J.D. Irving Limited)
33. Claims, Lower Coverdale (Noranda Inc.)
34. Bituminous shale development permits (A.A. (NB) Inc.)
35. Underground storage exploration licence (St. Clair Pipelines (1996) Ltd.)
36. Underground storage exploration licences (Intragaz)
37. Oil and natural gas licence to search (Jean Mariadassou)
38. Oil and natural gas licences to search (Corridor Resources Inc. / Columbia Natural Resources Canada, Ltd.)
39. Oil and natural gas licences to search (Corridor Resources Inc.)
40. Oil and natural gas licences to search (MariCo Oil and Gas Corporation)
41. Oil and natural gas licences to search and leases (J.A. Seglund, Inc.)
42. Oil and natural gas lease (RHT Enterprises Ltd.)
43. Oil and natural gas lease (Irving Oil Limited)
44. Oil and natural gas exploration licences pending



Simplified Zones of New Brunswick

1. Edmundston
2. Kedgwick
3. Tobique
4. Elmtree
5. Miramichi
6. Fredericton
7. Passamaquoddy
8. Saint John
9. Maritimes Basin
10. Fundy Basin

Figure 1. Some exploration properties in New Brunswick, 2000.

dimensional seismic target several hundred metres down plunge from the No. 6 open pit. The hole had a two-fold purpose: first, to confirm that the target represents the Brunswick horizon and, second, to gather rock-property data to help with the interpretation of the three-dimensional seismic survey that was shot in October.

The three-dimensional seismic survey covers a 42 km^2 area that is roughly 5 km wide by 8 km long (east–west and north–south, respectively) and is entirely north of the Nepisiguit River. It encompasses the Brunswick No. 6 deposit but not the No. 12 mine. Line cutting, blast-hole drilling and geophone-site surveying were completed in the summer. Western Geophysics began shooting the survey in September and completed the job in October.

In the latter part of 1999, a new discovery was made by prospecting near Mount Fronsac in the Upsalquitch–Halfmile Lakes belt (Figure 1: 5). To date, 41 holes totalling approximately 17 000 m have been drilled to test a large sulphide-bearing system that is hosted by rocks of the Flat Landing Brook Formation. Drilling continues but to date it has not been possible to demonstrate continuity between the higher grade sections.

No further drilling was undertaken at the Halfmile Lake Deep Zone (Figure 1: 6), which was discovered in 1999 as a result of following up a three-dimensional seismic target. Thick intervals of massive sulphide were encountered in several drill holes but the grades were not sufficient to warrant further drilling at that depth. However, three holes totalling 2300 m were drilled at Halfmile Lake North.

Hudson Bay Exploration and Development Co. Limited is a new player in the Bathurst Mining Camp and began early in the year by flying its in-house airborne geophysical system over parts of the camp. Because processing of this data took longer than expected, the company did not acquire ground until late summer. The company has staked about 200 claims in the western part of the camp and optioned additional claims, including some from Northeast Exploration Services Limited. One hole was drilled in the fall of 2000 to test an airborne target south of Portage Lakes (Figure 1: 7). The company expects to do more work in 2001.

Bathurst Mining Camp: Juniors Eastmain Resources Inc. has the second largest land position in the Bathurst Mining Camp after Noranda since March of 2000 when it entered into an option agreement with Stratabound Minerals Corp. Because the company is seeking a joint-venture partner, it provided field tours early in the summer for geologists from a number of major companies. Negotiations with one or more of these companies are still underway but Eastmain is optimistic that a deal will be concluded in the near future and a major drilling program will commence (approximately 7500 m).

During the summer, the company focused its exploration effort on one property, referred to as Railroad (Figure 1: 8). Most of this property has now been mapped geologically and covered by magnetic and induced polarization surveys. This work has been supplemented by whole-rock geochemical data (XRF analyses of existing samples from drill cores and surface exposures). Eight priority areas have been identified as follows: Railroad and Extension, Railroad Iron Formation (RIF), Railroad Footwall Zone (Figure 1: 8), Captain West (Figure 1: 9), Sprig Brook (Figure 1: 10), Roche Long Lac (Figure 1: 11), Island Lake and Island Lake East (Figure 1: 12).

A new alteration index (modified after Franklin) that is referred to as the modified chlorite index has been applied to the lithogeochemical data set, comprising in excess of 2000 analyses, including new and previously reported data. This index can be formulated as follows:

$$(FeO+MgO+K_2O) / ((FeO+MgO+K_2O) + (CaO+Na_2O) * 2)$$

There is a good spatial correlation between a high index value and degree of alteration of the footwall rocks on this property. A very large area of altered rocks of the Nepisiguit Falls Formation occurs along strike of the Railroad Footwall Zone (Figure 1: 8). A second 2 km long alteration zone occurs southwest of the Captain deposit and a third is northeast of the CNE deposit (Figure 1: 9). In each of these three areas no previous drilling has been reported.

PGE Resource Corporation drilled two holes, totalling about 800 m, in early summer on its Bills Lake property (Figure 1: 13), north of Chester. The company is currently in the process of drilling two more holes and is encouraged by the results so far.

Major General Resources Limited received a small grant through the New Brunswick Exploration Assistance Program to carry out further induced polarization surveys on its Nepisiguit property (Figure 1: 14). Drill targets have been identified but drilling will not commence until 2001.

Slam Exploration Ltd. became a listed company on the Alberta Exchange in the latter part of 1999 and initially focused its exploration on gold properties outside of the Bathurst Mining Camp. However, the company is now placing more emphasis on base metals and as a result has recently begun work on its Clearwater property (Figure 1: 15) near Chester and expects to be working the Wedge property (Figure 1: 16) as well.

Forest Gate Resources Inc. is a new, as yet unlisted, junior company that has recently acquired a modest land position in the Bathurst Mining Camp, which includes the Canoe Landing Lake deposit (Figure 1: 17), formerly held by E.A. Brooks. In 1999, Mr. Brooks proposed a new exploration model for this deposit based upon a re-evaluation of existing data, which the company is now pursuing. One of the principals in this company, P.K. Gummer, was an active player in the camp in the mid-1970s when Sabina Industries Limited found the Flat Landing Brook deposit. The company is currently staking more claims in the area.

Outside the Bathurst Mining Camp: Phelps Dodge Corporation of Canada Ltd. staked two blocks, totalling about 120 claims, in the southern part of the Upsalquitch Forks map area (NTS 21 O/10). Early in the year, the company entered preliminary negotiations with Rufus Smith of Log House Construction Ltd. for his Malachite property (Figure 1: 18), west of Portage Lakes, which hosts a porphyry system. However, the company has not carried out work on its claims in recent months or followed up on the negotiations.

Slam Exploration Ltd. drilled 15 holes, totalling 1926 m, on the Clarinda gold property (Figure 1: 19) near Lower Tetagouche Lake, which is under option from Lorenzo Noel. The best intersections reported were 5.6 m of 1.79 g/t Au (including 1.5 m of 4.29 g/t Au) in hole CL0003 and 2.0 m of 3.10 g/t Au (including 0.5 m of 5.26 g/t Au) in hole CL0015. The company does not plan to renew its option agreement but it has staked an additional 500 claims in the area.

Slam also carried out a trenching program in an attempt to find the source of geochemical anomalies on its Lewis Brook Pb–Zn property (Figure 1: 20), which is near the Sewell Brook and Mount Costigan deposits. The Lewis Brook and Clarinda properties are in the Tobique–Chaleur metallogenic zone. The company expects to drill test targets in 2001.

Early in 2000, Fancamp Resources Ltd. and joint-venture partner Heron Mines Limited drilled five holes, totalling about 1500 m, on the Turgeon Cu–Zn property (Figure 1: 21) near Belledune in order to test a new geological interpretation and an induced polarization target. The best hole (F-1) intersected 19.3 m (approximately 16 m true thickness) of massive sulphides grading 2.31% Cu, 0.49% Zn and 1.6 g/t Ag, including a 5 m interval grading 3.79% Cu.

Subsequently, 219 claims have been staked adjacent to the Turgeon property and a consortium of companies planned to fly a high-resolution airborne survey over the entire area in the latter part of 2000. The survey will be done from a helicopter platform.

Wayne Lockhart added about 250 claims to his large nickel property (Figure 1: 22) in the northeastern part of the Kedgwick map area (NTS 21 O/11). The bedrock source(s) of the stream-sediment nickel anomalies has (have) not been verified. Therefore, the company has been testing different sample media and geochemical techniques in order to obtain data from plateau areas between the deeply incised stream valleys. The company also plans to do a couple of gravity profiles to determine if the large total-field magnetic anomaly is caused by a mafic intrusion.

Southern New Brunswick

Exploration for precious metals and base-metal sulphides continued in southern New Brunswick during 2000. The most vigorous activities were related to the expansion of resources on known gold properties and the search for new gold occurrences in the southwestern part of the province. Recent work in this area has demonstrated that there is excellent potential for substantial gold deposits associated with Sn–W-bearing granites. This environment is strikingly similar to that found in the gold districts developing in the Tintina belt in Alaska and the Yukon.

In southwestern New Brunswick, Freewest Resources Canada Inc. continued a trenching and stripping program on its Clarence Stream property (Figure 1: 23), which occurs in a skarn/contact metasomatic environment along the northwestern flank of the Saint George Batholith. Quartz veins up to 3 m wide and associated alteration zones occur within structural traps that have been traced more than 2 km along strike. Mineralized veins and alteration zones commonly yield spectacular gold grades and, in general, may indicate the presence of a high-grade, medium-tonnage deposit like the Pogo deposit in the Tintina belt.

A very active group of New Brunswick prospectors and geologists has been conducting geochemical surveys and prospecting on numerous properties in the search for gold associated with granites in the same area. The group includes Pro-Max Resources Inc. (Emilio Doiron), Southfield Resources Ltd. (William Gardiner), Peter Fenety, Raymond Thorn and David Stevens. Many of their properties have known, granite-related gold potential. As well, these prospectors have found several new occurrences of gold-bearing rock similar to that at Clarence Stream, which further enhances the potential for significant deposits of this type in the region.

Several other junior mining companies and geoscientists are becoming active near Clarence Stream as well. These include Union Gold Inc., Murgor Resources Inc., PGE Resource Corporation, Rubicon Minerals Corporation, Fancamp Resources Ltd., Golden Hope Mines Limited and Avard Hudgins. Most have conducted geochemical surveys and have prospected on many of their claim groups. In general, results to date indicate the presence of numerous geochemical anomalies that will be followed-up in the near future by detailed sampling and trenching programs.

There is also demonstrated potential for granite-related gold associated with the Pokiok Batholith in the south-central part of the province. This is exemplified in gold-bearing skarns exposed at lower levels in the Lake George antimony mine. Although there is no active exploration at Lake George, extensive work is underway on the Sisson Brook W–Mo–polymetallic deposit (Figure 1: 24) along strike. This property, held by the Champlain Financial Group Ltd., was recently optioned to Pan American Resources Inc. and an intensive exploration program is currently being conducted.

In the southeastern part of the province, gold exploration was mostly limited to the northeasterly trending belt along strike from the Cape Spencer mine, south of Saint John. Pro-Max Resources Inc. continued to delineate zones on its Armstrong Brook property (Figure 1: 25) where voluminous, high-grade, visible-gold-bearing quartz vein systems occur within this gold-rich thrust and fold belt. Continuity of well-defined mineralized structures hosting these vein systems has been demonstrated over a distance of more than 2 km on the property.

Exploration for base-metal sulphides focused on two main areas in south-central New Brunswick, one north and one south of Fredericton. To the north, Patrick Marr initiated ground geophysical surveys and follow-up sampling programs to investigate massive sulphide horizons in Lower Ordovician rocks near Eel River (Figure 1: 26). He has been successful in tracing these stratiform horizons for several kilometres across the property. South of the Marr claims, Sheila Watters and Mark Connell conducted a pionjar sampling survey in tills on their claims in the vicinity of Deadwater Brook (Figure 1: 27) in order to pinpoint the source of a high-grade, auriferous, massive sulphide boulder found previously. Detailed till mapping and sampling established that the boulder is locally derived. South of Frederiction, PGE Resource Corporation continued trenching and/or prospecting on its Albright Brook and New River properties (Figure 1: 28, 29) in search of volcanogenic massive sulphide deposits.

INDUSTRIAL MINERALS

During 2000, exploration for industrial minerals focused mainly on expanding the resource potential for high-calcium limestone and titanium deposits.

The main target for high-calcium products is Carboniferous limestone of the Windsor Group. Graymont (NB) Inc. (formerly Havelock Lime Ltd.) conducted a 71-hole diamond-drilling program totalling 3193 m on its Hicksville property (Figure 1: 30) north of Havelock. The program, which was completed late in 1999, was successful in outlining a significant new resource and provided valuable geological information for further exploration. In the same area, Lafarge Canada Inc. re-evaluated deposits on its Springhill property (Figure 1: 31). A detailed geological mapping, compilation and resource calculation program led to a significant increase in reserves.

The Neoproterozoic Ashburn Formation also hosts high-calcium lime deposits, particularly immediately east of Saint John. In this area, J.D. Irving Limited drilled four short diamond drill holes on its Bonney Road claim group (Figure 1: 32) and other companies conducted grass roots exploration activities on several properties.

Noranda Inc. has re-activated its diamond-drilling program as a means of further investigating the titanium potential at Lower Coverdale (Figure 1: 33) south of Moncton. In this area, extensive titanium and phosphorous mineralization is associated with a Lower Devonian, mafic/ultramafic complex buried beneath the Carboniferous Cover Sequence. Two of the original diamond-drill holes will be deepened and additional holes are planned.

In addition to the above, an American company has expressed interest in the Jurassic basaltic rocks that occur in southwestern New Brunswick. The company has developed a new process to produce filament from basalt for a variety of purposes.

HYDROCARBONS AND UNDERGROUND STORAGE

A.A. (NB) Inc., a New Brunswick company wholly owned by a Malaysian parent company, holds two bituminous shale development permits south of Moncton in the Albert Mines and Dover areas (Figure 1: 34). These permits have a total land area of 1077 ha. In 1999, the company carried out a shallow core-hole drilling program on both permit areas.

The Maritimes & Northeast pipeline was placed into service early in the year, carrying natural gas from Sable Island to customers in the Maritimes and New England. A lateral line is under construction from the main line to the city of Saint John.

St. Clair Pipelines (1996) Ltd. of Chatham, Ontario holds an 895 ha underground storage exploration licence in the Dorchester area (Figure 1: 35). The area is underlain by a Windsor Group salt body. St. Clair continues to assess the potential of the site.

Intragaz, from Trois-Rivières-Ouest, Quebec, currently holds approximately 27 800 ha in underground storage exploration licences in southeastern New Brunswick (Figure 1: 36). The company was granted two additional exploration licences in 1999. The licence areas are: Baie Verte (628 ha), Sackville (7457 ha), Port Elgin–Coppermine (15 363 ha), Uniacke Hill (650 ha), Jolicure (2356 ha) and Point de Bute (1347 ha). All licences are in good standing and the company is assessing the geological and geophysical data available for the salt bodies under the licences.

Presently, 599 981 ha of land in New Brunswick are held under a number of oil and natural gas licences to search and leases. Companies holding licences to search are: Jean Mariadassou (10 521 ha southeast of Edmundston), J.A. Seglund, Inc. (19 047 ha south of Moncton), Corridor Resources Inc./ Columbia Natural Resources Canada, Ltd.[CNRC] (126 587 ha southeast and southwest of Moncton), Corridor Resources Inc. (53 935 ha north of Sussex), MariCo Oil and Gas Corporation (381 999 ha south and northwest of Moncton and near Fredericton). Companies holding leases are: Irving Oil Limited

(2153 ha south of Moncton), RHT Enterprises Ltd. (2146 ha northeast of Moncton), and J.A. Seglund Inc. (3590 ha on four blocks south of Moncton).

Jean Mariadassou, an independent, continued to assess the results of drilling a well in slate and limestone of the Matapedia Group southeast of Edmundston (Figure 1: 37).

In late fall of 1999, Corridor Resources Inc. from Halifax, Nova Scotia spudded Will DeMille #1 near Elgin on licence to search ONG 97-02. The well was abandoned at a total depth of 2644 m. Corridor and Columbia Natural Resources Canada, Ltd. from Fredericton concluded the 50% transfer of interest in licences to search ONG 95-02, 95-03, 95-04, 95-05, 97-02 and 97-03. Two exploration wells, Columbia/ Corridor TCH G-100-2329 and Columbia/Corridor Copper Mine Hill F-88-2329, were spudded on ONG 95-02 northwest of Sackville. The licences are located in the Sackville and Moncton subbasins, southeast and southwest of Moncton, respectively (Figure 1: 38).

Corridor retained 100% of licences to search ONG 97-04, 98-09 and 98-10 (Figure 1:39). Corridor and joint venture partner, Potash Corporation of Saskatchewan Inc. (PCS) encountered natural gas in their PCS/Corridor McCully #1 well. The well is located 11 km northeast of Sussex and 55 km south of the Maritimes & Northeast pipeline on licence to search ONG 98-09.

MariCo Oil and Gas Corporation, with an office in Fredericton, currently maintains 14 licences to search totalling 381 999 ha in south-central and southeastern New Brunswick (Figure 1: 40). At the same time, MariCo has a farm-in agreement with J.A. Seglund Inc. on 22 637 ha, of which 19 047 ha are under licence to search and 3590 ha are under four leases that lie to the southeast and east of the Stoney Creek oil and gas field (Figure 1: 41). The Downey #1 well, drilled by MariCo on Seglund licence to search ONG 93-01, remains shut in. A well licence was issued to MariCo to drill an oil well, MariCo Taylor Village OW#2, late in December. It was followed in the new year by MariCo Albert Mines OW#4 well. Both wells are in the completion phase. CNRC as operator and 50% joint venture partner in all of MariCo's holdings, conducted an extensive drilling program on licences to search ONG 93-01, 95-01 and 93-02. The wells spudded included Columbia Taylor Village #3, Columbia Beaver Brook #1, Columbia Beaumont Strat Test, Columbia Boudreau A-36-2328, and Columbia Albert Mines L-44-2328. During the summer and into the fall, CNRC conducted an extensive aeromagnetic survey on a 22 000 km^2 block of southern and southeastern New Brunswick. Two well licences, Columbia Monteagle G-56-2226 and Columbia Monteagle J-67-2226 were issued in December; they are located on licence to search ONG 97-06.

In 1999, Columbia Natural Resources of Charleston, West Virginia, through its Canadian production affiliate, Columbia Natural Resources Canada, Ltd. (CNRC) expanded its investment in Canada by acquiring properties and establishing two new joint venture arrangements. CNRC acquired a 50% working interest in all of MariCo's New Brunswick licences and 50% interest in the Downey #1 discovery well. Also, Corridor Resources Inc. signed a joint venture agreement with CNRC by which a 50% working interest was purchased in Corridor's Sackville and Moncton Subbasin licences.

J.A. Seglund Inc.'s block of four leases lie to the southeast and east of the Stoney Creek oil and natural gas field (Figure 1: 41)

RHT Enterprises Ltd. converted its two licences to search to a six-section lease. During the first year, exploration work on the lease remained suspended. (Figure 1: 42).

Irving Oil Limited conducted an inventory of wells and equipment at the Stoney Creek oil and gas field. The field, shut-in with production suspended, is located on a 2153 ha lease (Figure 1: 43). Currently, the lease is in the seventh year of a ten-year term.

The New Brunswick Department of Natural Resources and Energy, in accordance with the *Oil and Natural Gas Act*, advertized eight areas of the Province in "Call for Tenders #16". The public offering for a total of 110 428.5 ha located in eastern and south-central New Brunswick closed December 7, 2000. There is a combined commitment by five companies to spend in excess of $8 200 000 on exploration in years 1 and 2 of the first term (Figure 1: 44).

STATISTICS

Federal

Mineral Exploration Expenditure Surveys are carried out by Natural Resources Canada, assisted by the New Brunswick Department of Natural Resources and Energy (Mineral Information Services). The exploration expenditures are collected through two surveys each year. The Preliminary/Forecast in September followed by the Actual in January. Table 1 summarizes the results of the most recently available surveys.

Provincial

The Recorder's office maintains an electronic claim tracking system that is updated as applications to record are received, as claims are renewed, transferred, regrouped or expire, and as reports of work are received (Table 2, Figure 2).Lease and licence documents and agreements issued under the various Acts are maintained and updated as required.

Table 1. Summary of Mineral Exploration Expenditure Surveys
(Source: Natural Resources Canada)

Form No.	Survey Name	No. Surveyed	General Exploration	Mine Site Exploration	Total*
Ex-1	Preliminary '99	53	6 300 000	2 200 000	8 500 000
Ex-3	**Actual '99**	**53**	**8 300 000**	**1 700 000**	**10 000 000**
Ex-1	Forecast 2000	53	6 100 000	2 200 000	8 300 000
Ex-1	Preliminary 2000	52	8 400 000	2 000 000	10 400 000
Ex-1	Forecast 2001	52	7 700 000	2 500 000	10 200 000

* Survey includes overhead expenditures.

Table 2. New Brunswick Mineral Resource Allocation and Exploration Statistics, 1999 and 2000

Mineral Resource Allocation (total in effect at year's end unless specified for the year)	1999		2000	
	Number	Hectares	Number	Hectares
Mining Act				
Prospecting Licences Issued (year)	n/a	---	56	---
Prospecting Licences Holding Claims	n/a	---	156	---
Claims Recorded (year)	1 771	28 336	3 084	49 344
Claims Renewed (year)	12 641	202 256	11 946	191 136
Claims Expired (year)	4 822	77 152	2 905	46 480
Claims in Effect	14 884	238 144	15 030	240 480
Coal Agreements	4	58 917.6	4	58 917.6
Potash Exploration Agreements	0	0	0	0
Potash Leases	2	20 024.2	2	20 024.2
Mining Leases	17	12 528	17	12 528
Total Agreements and Leases (above)	---	91 469.8	---	91 469.8
Total in Effect	---	329 613.8	---	331 949.8
Oil and Natural Gas Act				
Licences to Search	28	624 978	26	592 091.5
Leases	5	5 744	6	7 890.1
Bituminous Shale Act				
Licences to Search	0	0	0	0
Development Permits	2	1 077	0	0
Leases	0	0	0	0
Underground Storage Act				
Storage Exploration Licences	7	28 791	7	28 791
Storage Licences	0	0	0	0
Construction Permits	0	0	0	0
Quarriable Substances Act				
Quarry Permits	233	---	256	---
Quarry Leases	15	629.62	16	608.155
Peat Exploration Licences	4	1955	4	1955
Peat Leases	33	13 303.6	33	13 303.6
Peat Options	14	4 604	14	4 604

Exploration Summary	1999		2000	
	Work Reported	Value	Work Reported	Value
Mining Act				
Reports of Work (RW)	107 reports filed	$3 848 269	77 reports filed	$7 458 948.26
Drilling Reported in RW	143 holes (23 982 m)	$1 598 834	203 holes (14 698 m)	$1 256 181.81
Potash Exploration	---	0	---	0
Oil and Natural Gas Act	4 wells (5808 m*)	n/a	11 well (21 900 m*)	$10 000 000
Bituminous Shale Act	1 well (387 m)	n/a	---	0
Underground Storage Act	---	0	---	0

n/a not available

* licensed depth

January , 2001

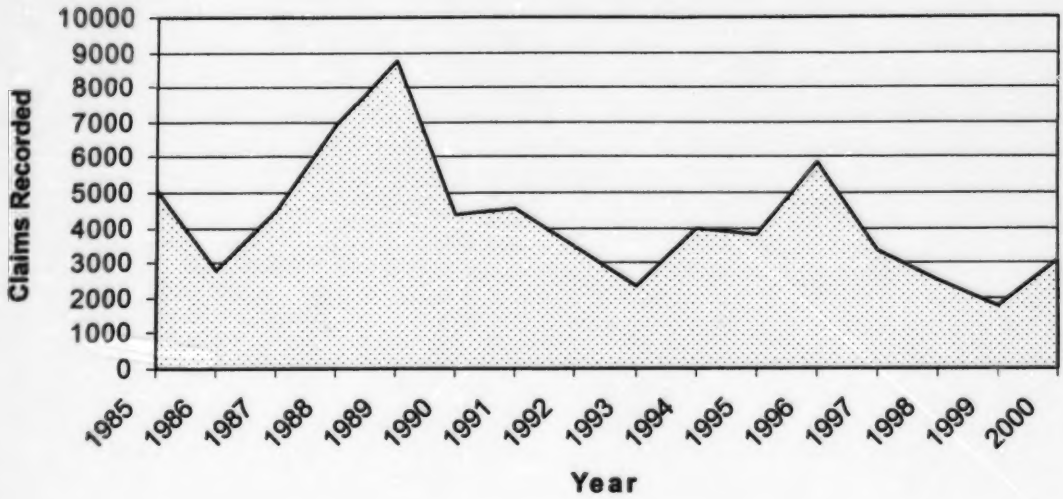


Figure 2. Mineral claims recorded, 1985–2000.

PROVINCIAL EXPLORATION AND DEVELOPMENT INITIATIVES

The Mineral Exploration Stimulation Program (MESP), an assistance program for prospectors, provides grants to help them defray prospecting costs such as chemical analysis, mileage, meals and claim registration. The program provided $60 000 in funding to 38 applicants in 2000. The average value of the grants was $1575.

The New Brunswick Exploration Assistance Program (NBEAP) is an assistance program for junior mining companies. It provides financial assistance of 50% of exploration costs up to a maximum of $40 000 per project. Funding in the amount of $350 000 was allocated for 2000–2001 by the Province, through the Regional Development Corporation. Twelve applicants (14 projects) were approved for assistance.

The Value-Added/Mineral Processing Program (VAMP), which was launched in 1996 in accordance with New Brunswick's Mineral Policy, is designed to provide funding on a shared basis for projects that could enhance the value of New Brunswick's minerals either by processing them to a higher level, or by improving the recovery of present products. In 2000, the program funded one study on geochemical technology.

Three introductory prospecting courses are planned for February–March, 2001. They will be held in Bathurst, Fredericton and Moncton.

NEW BRUNSWICK MINES AND QUARRIES

PRODUCTION STATISTICS

The 2000 value of mineral production (including coal) in New Brunswick is estimated to be $790 573 087, representing a drop of 7% from the final value of $848 536 514 in 1999 (Table 3; Figure 3). The year 2000 marked the first full year without production from Noranda's Heath Steele base metals mine, which closed at the end of October, 1999. An increase in the zinc price was not sufficient to offset this loss of production in the metals sector. The Canadian dollar averaged US 67.34¢ for the year, almost identical to its average value in 1999.

The value of metals production during the year was $522 973 342, which represents 66% of the Province's value of mineral production. Overall, the sector was down by 12% because of the closure of Heath Steele. Noranda's Brunswick mine experienced slightly higher throughput. CanZinco's Caribou mine remained shut down for the second full year after low metal prices and metallurgical difficulties had forced a suspension of operations in August 1998. Zinc continued to dominate the metals sector, with a value of $397 871 437, which represents 76% of the total value of metals. The value of zinc production decreased approximately 12% from 1999. The average price of zinc increased by 4.9% between 1999 (48.8¢/lb. [U.S.]) and 2000 (51.2¢/lb. [U.S]). The average exchange rate of the Canadian dollar was not a factor in the value of production, as it remained unchanged from the year before. Lead contributed $44 602 156 to the value of metal production, down 17% from 1999. Production of lead fell by 8%, while the price fell by almost 10%. The 2000 average London Metal Exchange price for lead was 20.6¢/lb. (U.S.), down from 22.8¢/lb. (U.S.) in 1999. The value of copper production increased by 2%, to $25 507 065 on the strength of a 15% increase in the price (82.2¢/lb. in 2000 vs 71.4¢/lb. in 1999), even though production fell by 11%. Antimony, bismuth, and cadmium continued to be produced as by-products from the Brunswick operation. The total value of the three by-product metals was practically unchanged. Gold production increased by 6.6% after a substantial decline in 1999 and the value increased by a similar margin as the price remained unchanged. After a drop in 1999, the value of silver production fell by a further 14%, as a 9.6% decrease in production was compounded by a 4.9% drop in the average price.

The nonmetals sector of the industry contributed $202 846 361 (26%) to the value of mineral production, a 10% increase over the 1999 value. The largest contributor to the value of nonmetals production is potash. Both the value and quantity of potash increased from 1999 levels. Peat, the second largest contributor ($59 621 134) to the value of nonmetals production, represented 29% of the value of nonmetals. For the second consecutive year, both the amount and value of peat produced were higher than in the year before. Salt and sulphur in smelter gas ranked next in value of production, with quartz and marl being minor contributors to the nonmetals sector.

The value of coal produced by N.B. Coal Limited in the Minto–Chipman area increased by 16% to $24 172 000, despite a 4% decrease in production.

The value of production for structural materials (lime, stone, sand and gravel) decreased 14% to $40 581 384. Sand and gravel production was down 17%, while stone production decreased by almost 22%. These commodities provide the raw material for the construction industry in New Brunswick.

Table 3. Mineral Production in New Brunswick, 1999 and 2000
(Source: Natural Resources Canada)

Commodity	Unit	1999 Final		2000 Preliminary	
		Quantity	Value ($)	Quantity	Value ($)
Metals					
Antimony	kg	*	*	*	*
Bismuth	kg	206 572	2 285 306	194 230	2 231 120
Cadmium	kg	250 419	145 243	217 312	114 306
Copper	kg	10 636 176	24 984 377	9 422 632	25 507 065
Gold	g	*	*	*	*
Lead	kg	71 978 394	53 695 882	66 570 382	44 602 156
Silver	kg	227 879	57 151 012	205 909	49 184 128
Zinc	kg	283 924 907	453 995 926	237 535 186	397 871 437
TOTAL			595 437 842		522 973 342
Nonmetals					
Marl	t	*	*	*	*
Peat	t	422 100	51 450 226	470 710	59 621 134
Potash	t	*	*	*	*
Quartz (silica)	t	*	*	*	*
Salt	t	*	*	*	*
Sulphur (in smelter gas)	t	106 451	7 326 184	106 451	6 838 412
TOTAL			185 020 794		202 846 361
Fuels					
Coal	t	252 000	20 870 000	243 000	24 172 000
TOTAL			20 870 000		24 172 000
Structural Materials					
Lime	t	*	*	*	*
Sand and Gravel	t	4,491 888	*	3 720 956	*
Stone	t	4 387 843	23 140 577	3 436 349	19 212 257
TOTAL			47 207 878		40 581 384
GRAND TOTAL (CDN)			$ 848 536 514		$ 790 573 087

* confidential information

March, 2001

GRAND TOTAL 1998 (CDN $) $ 862 992 354

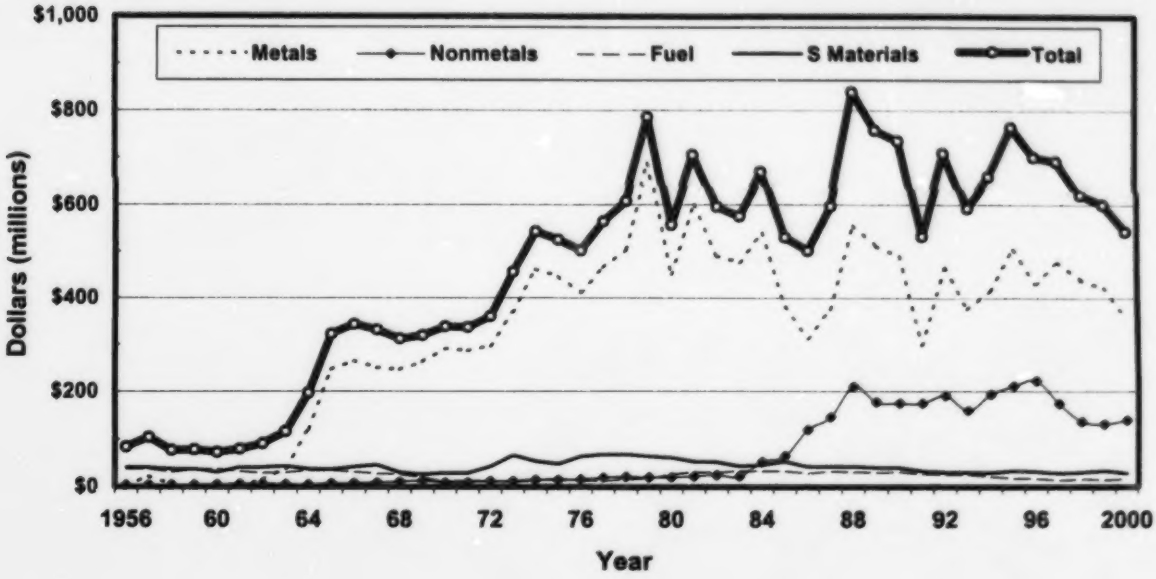


Figure 3. Value of mineral production in New Brunswick, 1956–2000. Source: Natural Resources Canada (1986=100). Abbreviation: S Materials – structural materials.

METALLIC MINERALS

Operating Mines

Noranda Inc. – Brunswick Mine was able to increase production further to more than 9 500 t/d over the course of the year. In 1996, the company had reduced target production to 9000 t/d from the previous planned rate of 10 500 t/d because of a marked increase in seismic activity, which resulted in some areas becoming unavailable for mining.

In March 2000, a section of the main surface conveyor collapsed, threatening a prolonged disruption to milling operations. In the event, repairs were completed far ahead of schedule, but with a week's loss of production. In the fall of the year, several major seismic events resulted in the closure of one of the main production blocks. Once again the ingenuity of the mine operators succeeded in preventing significant production losses. Intensive efforts continue to rehabilitate the affected zone and reincorporate it into the mineable reserves.

Zinc accounts for approximately 76% of the value of Brunswick's production. Lead, copper and silver represent most of the remaining 24%. Both mine and smelter (Figure 4:1a and 1b) ran largely uninterrupted throughout the year, with the brief disruptions noted above. Employment remains steady, other than a temporary increase in the number of contract employees rehabilitating the underground workings.

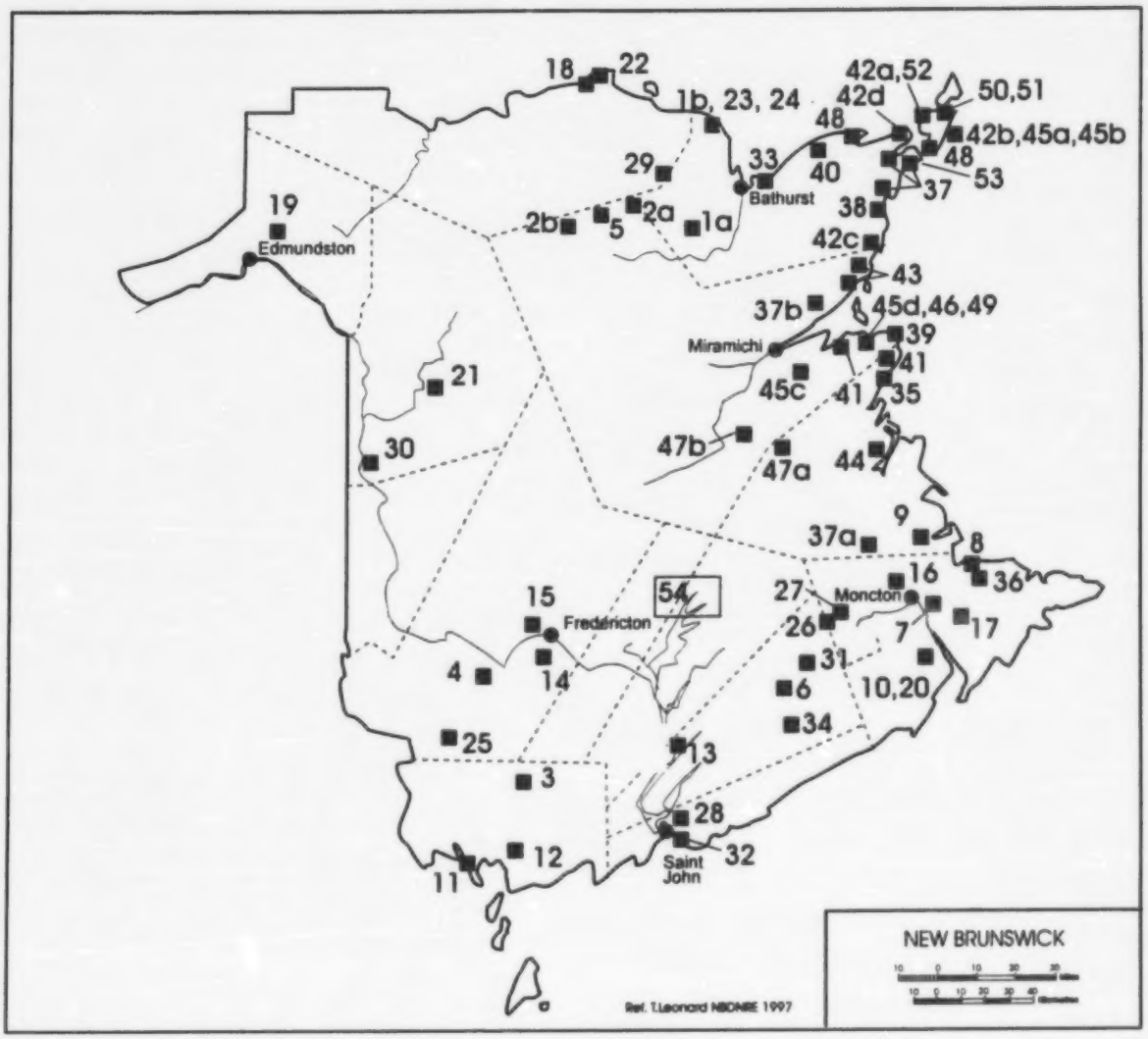


Figure 4. Mines and quarries in New Brunswick, 2000 (including two northern New Brunswick power-generating facilities).

1a. Brunswick No. 12 mine (Noranda Mining Inc.–Brunswick Mine) Zn, Pb, Cu, Ag
1b. Belledune smelter (Noranda Mining Inc.–Smelter)
2a. Caribou mine (Caribou Mine Division of CanZinco Ltd.) Zn, Pb
2b. Restigouche mine (Caribou Mine Division of CanZinco Ltd.) Zn, Pb, Ag, Cu
3. Mount Pleasant deposit (ADEX Mining Corporation) Sn, In, Zn, Bi, W
4. Lake George mine (APOCAN Inc.) Sb
5. Murray Brook mine (Murray Brook Resources Inc. (a wholly owned subsidiary of NovaGold Resources Inc.)) Au, Ag, Cu
6. Nelson Monuments Ltd. (dimension stone)
7. Maritime Stone Works Inc. (dimension stone)
8. Smith Cut Stone and Quarries Limited (dimension stone)
9. Bastarache Stone Quarrie (dimension stone)

Figure 4 (concluded)

10. Hillsborough area (Ken Whaley) limestone
11. Port of Bayside (Charlotte County Ports Limited) aggregate
12. North of Lake Digdeguash (Jamer Materials Ltd., pit operator) sand
13. Lafarge Construction Materials (sand and gravel)
14. Diamond Construction Limited (crushed stone)
15. Gray Stone Quarries, a division of Tri Gil Paving and Construction Ltd.; Warren Maritimes Ltd. (crushed stone)
16. Moncton Crushed Stone, a Division of Modern Construction Ltd.; H.E. Carson Limited (crushed stone)
17. Acadia Crushed Stone Division of Modern Construction Ltd.; MacDonald Paving and Construction Limited (crushed stone)
18. C.M. Stewart Company Limited (crushed stone)
19. Clarence Daigle et Fils Ltée (crushed stone)
20. Albert Mines area (Ken Whaley) gypsum
21. Plaster Rock area (Daniel F. Merrithew) gypsum, limestone
22. Dalhousie power-generating facility (N.B. Power)
23. Belledune power-generating facility (N.B. Power)
24. Canadian Gypsum Company Inc. (gypsum briquettes)
25. McAdam manufacturing facility (Westroc Industries) gypsum wallboard
26. Graymont (NB) Limited (limestone)
27. Lafarge Canada Inc. (limestone)
28. Brookville Manufacturing Company (limestone, dolomite)
29. Elmtree Resources Ltd. (limestone)
30. Upper Kent Lime Works Ltd. (marl)
31. Potash Corporation of Saskatchewan Inc. (New Brunswick Division) (potash, salt)
32. Saint John refinery (Irving Oil Limited) sulphur
33. Chaleur Silica Ltd. (a Division of the Shaw Group) (silica)
34. Atlantic Silica Inc. (silica)
35. ASB Greenworld Ltd. (peat)
36. Beausejour Peat Moss Inc. (peat)
37. Compagnie de Tourbe Fafard Ltée (peat): (a) Kent; (b) Burnt Church
38. Les Entreprises Jean-Eudes Martin et Fils ltée (peat)
39. Good Earth Canada Ltd. (peat)
40. Grande Anse Peat Moss Co. Ltd. (peat)
41. Le Groupe Berger Ltée (peat)
42. Le Groupe Qualité Lamèque Ltée (peat): (a) Lamèque (b) St. Raphaël; (c) Canadian Supreme; (d) Pokesudie
43. Heveco Ltd. (peat)
44. Malpec Peat Moss Ltd. (peat)
45. La Mousse Acadienne (1979) Ltée (peat): (a) Acadienne; (b) Chiasson; (c) Miramichi; (d) Eel River
46. PaSi Peat Inc. (peat)
47. Premier Horticulture Ltée—Division Rogersville (peat): (a) south and (b) west of Rogersville
48. Sun Gro Horticulture Canada Ltd. (peat)
49. Theriault & Hachey Peat Moss Ltd. (peat)
50. La Tourbe de Pigeon Hill Ltée (peat)
51. La Tourbière de Petit-Shippagan (peat)
52. La Tourbière du Centre de l'Île Ltée (peat)
53. Jiffy Products (N.B.) Ltd. (peat products)
54. N.B. Coal Limited (coal)

Suspended Operations

In 1997, *ADEX Mining Corporation* received a consultant's feasibility study for the development of the Mount Pleasant tin–indium–zinc–bismuth–tungsten deposit (Figure 4: 3). The conclusions were disappointing, as the estimated capital costs were too high to justify a production decision at that time. The property remains under care and maintenance. Negotiations are understood to be proceeding between the company and certain outside investors who have expressed an interest in acquiring the property.

APOCAN Inc. operations remain suspended at the Lake George antimony mine (Figure 4: 4). Problems with the hoisting system, as well as a slumping antimony price, forced a temporary shutdown in December 1996. Despite hopes that the price would recover sufficiently to allow a resumption of operations, high metal inventories in global markets continue to depress the price and in 2000 the mine was still under care and maintenance.

Caribou Mine Division of CanZinco Ltd., a wholly owned subsidiary of Breakwater Resources Ltd. commenced production from its two properties (Figure 4: 2a and 2b) in mid-1997, with the first ore going through the mill in July.

As part of the new operating plan, the Caribou concentrator was extensively modified and expanded. It was redesigned to produce separate zinc and lead concentrates, rather than a bulk concentrate as was the case when it last operated in 1990. Surface preparation of the Restigouche open pit (Figure 4: 2b) began in the fall of 1996. The first ore was produced in the spring of 1997. All ore from the Restigouche site was trucked to the Caribou mine site for processing. Notable efforts were made at Restigouche to protect the sensitive local environment.

Operations were suspended in September 1998 because of low metal prices and difficulties in achieving target mill recoveries. The company is continuing metallurgical studies and periodically updating its operating plan with a view to reopening when metal prices improve sufficiently.

Closures

Murray Brook Resources Inc. (a wholly owned subsidiary of NovaGold Resources Inc.) Under the impact of a substantially lower copper price, the company decided in 1998 not to proceed with further mining at Murray Brook (Figure 4: 5), despite some initially encouraging results from exploration drilling at the mine site. Full site reclamation was completed according to an approved plan in September 2000.

INDUSTRIAL MINERALS

In 2000, the development of industrial (nonmetallic) minerals in New Brunswick revolved around natural stone (e.g., sandstone, limetsone and granite), mineral aggregates (e.g., sand and gravel, and bedrock), gypsum, limestone/dolomite, potash, salt, silica and potash as well as industrial mineral by-products such as sulphur and flue-gas desulphurization gypsum.

Several of these find their way into regional and world markets in addition to the local market, which has a limited consumer base. The Province's favorable geographic location on tidewater provides the

critical link to global markets. An additional geographic advantage is New Brunswick's strategic location within a one- to two-day trucking distance of a regional market comprising 120 000 000 people. Prompt delivery and competitive prices help sustain the demand for the province's bulk industrial mineral and related products.

Natural Stone

In addition to the existing dimension stone processing facilities in New Brunswick (Figure 4: 6–9), a modest revival of the Province's stone industry that began a few years ago continued throughout 2000, which underlines the need for establishing an inventory of selected accessible and affordable stone products. One company extracts large sandstone blocks from a former quarry south of Moncton, shipping them on a fairly regular basis to distributors and fabrication facilities throughout Canada and the United States. Another example of industry growth has been the establishment of a new limestone quarrying operation near Hillsborough in southeastern New Brunswick (Figure 4: 10). This laminar-bedded stone will be used to produce various grades of flagstone and a host of other products for decorative and related landscaping applications. They will help satisfy the domestic demand for various stone products utilized by the residential and related construction and landscape industries.

Mineral Aggregate

Throughout the year, attention was directed toward aggregate materials for both domestic consumption and exports. On the domestic side, demand for higher-quality aggregate materials for major province-wide highway construction and related infrastructure projects continued at an almost unprecedented pace. Local supply shortages of quality granular materials and the high delivered costs of these materials from established sources are contributing to the growing preference for higher-valued crushed bedrock resources in the Province. This is a trend that will eventually be accompanied by an overall higher unit cost for aggregate in the future. On the export side, crumbling infrastructure, an expanding economy, high population densities and depletion of available quality aggregate resources along the Eastern Seaboard of the United States continues to offer development opportunities for New Brunswick. The Port of Bayside (Figure 4: 11) in southwestern New Brunswick exports 300 000 to 500 000 t of aggregate annually to destinations in the northeastern United States and elsewhere. Sand is transported from a pit about 25 km east of the port (Figure 4: 12) and crushed stone is quarried less than 300 m from the docking facility (Figure 4: 11). Aggregate resources from other locations in southern and northern New Brunswick may also have potential for marine export.

Dozens of small companies and independent contractors extract sand and gravel and related materials from numerous pits that, with few exceptions, are operated on an intermittent-demand basis. *Lafarge Contstruction Materials* is one of the larger operations in the Province (Figure 4: 13). The bulk of the Province's crushed rock is produced from ten to fifteen quarries, most of which are strategically situated near higher-demand centres or areas lacking in quality granular materials (Figure 4: 14–19).

Gypsum and Anhydrite

Gypsum was among the first minerals mined and exported from New Brunswick. Known around the world for gypsum of superior quality, southeastern New Brunswick was the centre of a thriving gypsum industry. In 1930, the first wallboard plant in Eastern Canada was built in the village of Hillsborough by the Canadian Gypsum Company. It remained in operation for nearly 50 years.

The 1990s have witnessed several interesting developments in gypsum-related activities in the Province. Gypsum is gaining acceptance as a soil amendment by the local farming community. As a result, *Mactaquac Mining Ltd.* has made several local shipments of agricultural gypsum from a quarry in near Albert Mines (Figure 4: 20) in southeastern New Brunswick. More recently, *Plaster Rock Gypsum and Manufacturing Limited* has recognized the potential for agricultural gypsum in northwestern New Brunswick and adjacent areas. In 2000, the company began establishing infrastructure for a small processing facility adjacent to its deposit a few kilometres east of the village of Plaster Rock (Figure 4: 21).

In recent years, gypsum has been produced synthetically as a combustion by-product from two fossil-fuel-fired power plants in northern New Brunswick, one near Dalhousie and the other at Belledune (Figure 4: 22, 23). The Montreal-based *Canadian Gypsum Company Inc.* (CGC) utilizes gypsum produced by the spraying of limestone (locally sourced) and water through hundreds of shower heads into sulphur-laden flue gases resulting from the combustion of coal and Orimulsion$_{tm}$ fuels. The gypsiferous product is a very fine-grained, dust-like material. To assist in handling this material, CGC has constructed a briquetting plant adjacent to one of the power generating stations at Belledune (Figure 4: 24). At this facility, the gypsum "dust" is compacted into pill-shaped briquettes, allowing dust-free handling and transportation. CGC takes 100% of the output from two power plants in the region, shipping approximately 200 000 t of gypsum briquettes annually through the adjacent Belledune port facility to Montreal where it is used to manufacture wallboard.

An interesting gypsum-based industry is located in western New Brunswick. *Westroc Industries*, whose parent company is BPB Industries of the United Kingdom, one of the two largest gypsum wallboard manufacturers in the world, produces wallboard from its state-of-the-art manufacturing facility at McAdam (Figure 4: 25). The company imports approximately 200 000 t of gypsum feedstock each year through the Bay of Fundy Port of Bayside, 60 km to the south (Figure 4: 11). The plant has undergone several operational improvements over the last few years and markets most of it products in the United States.

Limestone and Dolomite

Production at New Brunswick's limestone and dolomite operations has followed the steady upward trend of this sector over the last few years. Between 700 000 and 900 000 t of limestone and dolomitic limestone are processed annually from five operations: *Graymont (NB) Limited* of Havelock, *Lafarge Canada Inc.* of Havelock, *Brookville Manufacturing* of Saint John, *Elmtree Resources Ltd.* near Bathurst, and *Upper Kent Lime Works Ltd.* north of Bristol (Figure 4: 26–30). The limestone industry manufactures a range of chemical and pulverized products featuring agricultural and calcined/hydrated lime, and flue-gas desulphurization limestone as well as aggregate. In recent years, considerable research has been directed toward the development of new value-added lime and limestone products.

In 2000, limestone production throughout the Province continued at a pace near or slightly ahead of the record established in 1999, estimated at 1 200 000 t. Although market conditions suggest that this level of production may not be sustainable much longer, new quarries are being considered in the Havelock area of southern New Brunswick (Figure 1: 30) and in the French Village area northeast of Saint John. (Figure 1: 32). Given these expansion scenarios, it is possible that the Province's future annual limestone-related production could be maintained at or slightly above 1 000 000 t.

In the Havelock area, *Graymont (NB) Inc.*, formerly Havelock Lime, has been extending its reserves of high-calcium limestone (Figure 4: 26). Quarry expansions are in the preliminary planning stages at

two locations. Development activity at the company's Samphill quarry will result in the extraction of approximately 1 700 000 t of construction aggregate over the next two years. Under the terms of a special agreement, the Maritime Road Development Corporation is removing and processing low-chemical-grade limestone and related overburden material from Havelock's Samphill quarry to meet the strategic material requirements for the new Fredericton to Moncton highway project in this part of New Brunswick. Excavation of the overburden will assist in the economic recovery of the underlying reserves of steeply dipping, high-calcium limestone, thus extending the life of the quarry by several years.

Early in 2000, Goldcorp sold the Havelock Lime operation to Graymont Ltd. of British Columbia in order to raise funds to redevelop its Red Lake gold mine in northwestern Ontario. Graymont, with its wholly owned subsidiaries (Continental Lime, the Genlime Group, Graybec Calc Inc., and Bellefonte Lime Co. Inc.), is a privately owned Canadian corporation that is the fourth largest lime producing company in North America. The Havelock facility, renamed as Graymont (NB) Inc., is to be closely associated with the company's three lime plants and quarries in Quebec that are operated by its subsidiary, Graybec Calc Inc. Being a major player in the lime business, Havelock's parent company is to be proactive in making strategic investments into the operation to improve efficiency, product quality and possibly even expand operations.

Potash

Potash continues as a major contributor to the total value of the New Brunswick's mineral production, maintaining a position second only to zinc.

A world-class potash mining and processing facility, owned by the *Potash Corporation of Saskatchewan Inc. (New Brunswick Division)* [PCS (NB)], is situated 5 km east of the Town of Sussex in the southeastern part of the Province (Figure 4: 31). All processed tailings are returned underground, making it a closed circuit or "zero effluent" operation.

In the spring of 1998, a small brine inflow was discovered in one section of the mine. Since its detection, PCS (NB) officials have undertaken several mitigative strategies to resolve the dilemma. An underground drilling and grouting program has continued throughout 2000 and considerable progress has been made toward managing the situation.

PCS (NB) also drilled a hole (McCully No. 1) on its mining lease to gather appropriate geotechnical information related to the possibility of deep well injection of excess brine generated during the operation's milling process. This brine is currently trucked daily to another company operation nearby at Cassidy Lake where it is piped to the Bay of Fundy. Although the geotechnical data continues to be evaluated, it is noteworthy that enough natural gas was encountered in the hole to prompt further drilling and related studies to determine its quality and quantity. PCS has a 50% working interest in the gas rights, with the balance being held by Corridor Resources Inc.

Salt

More than half a million tonnes of salt is produced each year by *Potash Corporation of Saskatchewan Inc. (New Brunswick Division)* from its potash operation near Sussex, New Brunswick (Figure 4: 31). Although some salt is consumed within the region, a significant tonnage is trucked to and exported from the Port of Saint John. The material is sold exclusively to Cargill Salt, a division of Cargill Incorporated.

Sulphur

Since 1960, *Irving Oil Limited* has recovered sulphur from the oil refining process at its Port of Saint John refinery (Figure 4: 32). Plant capacity is reported at 200 t/d. [Natural Resources Canada. 1998. Mining and Mineral Processing Operations in Canada, Minerals and Metals Sector]

Natural Resources Canada reports that 106 451 t of sulphur (Table 3) were recovered from the smelting of ores from Noranda Inc.'s operations in northern New Brunswick in 2000.

Silica

New Brunswick supports two silica operations. In the Bass River area of northern New Brunswick (Figure 4: 33), a quartzose sandstone has been excavated by *Chaleur Silica Ltd. (a Division of The Shaw Group)* as a source of flux for a nearby lead smelter. A second operation, *Atlantic Silica Inc.*, produces a wide range of specialty silica products from a rather unique deposit of quartzose sand and gravel in the Cassidy Lake area of southern New Brunswick (Figure 4: 34).

Peat

Preliminary figures compiled by New Brunswick's Department of Natural Resources and Energy (DNRE) staff indicate that peat shipments in 2000 totalled about 12 000 000 standard bales with inventories standing at 2 800 000 bales early in the summer. About 14% of the production is shipped in a value-added form.

Seventeen companies were producing from 33 peatlands (Figure 4: 35–52) for a total area in production of 4200 ha. Most of the peat operations are located on Crown lands in the northeastern part of the Province. Three operations are located entirely on private lands. The f.o.b. value of shipments in 2000 is estimated to reach $80 000 000 (DNRE figures). Most of the production is sold in the USA (60 %) with Japan being the second largest foreign export market (16%). Direct revenue to the Province in the form of royalties will exceed $800 000 in 2000. During peak production, approximately 1200 people (including seasonal workers) were employed by the peat industry.

One company, *Jiffy Products (N.B.) Ltd.*, manufactures peat pots and peat pellets at its plant located in Shippagan, Gloucester County (Figure 4: 53). Seven primary peat producers also manufacture peat-based products, mainly growing substrates, for the professional horticultural industry.

HYDROCARBONS

N.B. Coal Limited, a subsidiary of NB Power, continued production in the Minto-Chipman area (Figure 4: 54). New Brunswick Department of Natural Resources and Energy figures indicate that a total of 204 118 t of coal was mined and 229 290 t of coal was shipped in 2000. The company continues to reclaim land disturbed by its coal mining operations.

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